

Amendment and Response- Under 37 C.F.R. §1.116 - Expedited Examining Procedure

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Serial No.: 09/560,268

Confirmation No.: 2517

Filed: April 26, 2000

For: COMPOSITIONS FOR SELECTIVELY ETCHING AGAINST COBALT SILICIDE (As Amended)

Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

Listing of Claims

1-63. Canceled

1-64. (Currently Amended) An etching composition, the composition comprising a mineral acid, a peroxide, and deionized water at a ratio in a range of about 1:1:25 (mineral acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water), wherein the composition has an etch rate greater than about 1000 Å/minute for cobalt at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade and an etch rate of about 50 Å/minute to about 250 Å/minute for metal nitride at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade.

2 65. (Previously Presented) The etching composition according to claim 64, wherein the mineral acid is HCl and the peroxide is hydrogen peroxide.

66. Canceled

3 67. (Previously Presented) The etching composition according to claim 64, wherein the mineral acid is selected from the group consisting of HCl, HNO₃, H₂SO₄, H₃PO₄, and HF.

4 68. (Previously Presented) An etching composition, the composition comprising a mineral acid, a peroxide, and deionized water at a ratio in a range of about 1:1:35 (mineral acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water), wherein

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the composition has an etch rate greater than about 1000 Å/minute for cobalt at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade.

- 5 69. (Previously Presented) The etching composition according to claim 68, wherein the mineral acid is HCl.
- 6 70. (Previously Presented) The etching composition according to claim 68, wherein the peroxide is hydrogen peroxide.
- 7 71. (Previously Presented) The etching composition according to claim 68, wherein the ratio is in a range of about 1:1:25 (mineral acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water).
- 8 72. (Previously Presented) The etching composition according to claim 68, wherein the composition has an etch rate of about 50 Å/minute to about 250 Å/minute for metal nitride at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade.
- 9 73. (Previously Presented) An etching composition, the composition comprising a mineral acid, a peroxide, and deionized water at a ratio in a range of about 1:1:35 (mineral acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water), wherein the composition has an etch rate of about 50 Å/minute to about 250 Å/minute for metal nitride at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade.
- 10 74. (Previously Presented) The etching composition according to claim 73, wherein the mineral acid is HCl.
- 11 75. (Previously Presented) The etching composition according to claim 73, wherein the peroxide is hydrogen peroxide.

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12-76. (Previously Presented) The etching composition according to claim 73, wherein the ratio is in a range of about 1:1:25 (mineral acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water).

77-88. Canceled

13-89. (Previously Presented) An etching composition, the composition consisting essentially of a mineral acid, a peroxide, and deionized water at a ratio in a range of about 1:1:35 (mineral acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water), wherein the composition has an etch rate of about 50 Å/minute to about 250 Å/minute for metal nitride at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade and an etch rate greater than about 1000 Å/minute for cobalt at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade.

14-90. (Previously Presented) The composition according to claim 89, wherein the mineral acid is HCl and the peroxide is hydrogen peroxide.

91. Canceled

15-92. (Previously Presented) The composition according to claim 89, wherein the ratio is in a range of about 1:1:25 (mineral acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water).

16-93. (Previously Presented) The composition according to claim 89, wherein the mineral acid is selected from the group consisting of HCl, HNO₃, H₂SO₄, H₃PO₄, and HF.

17-94. (Currently Amended) An etching composition, the composition comprising a mineral acid, a peroxide, and deionized water at a ratio in a range of about 1:1:25 (mineral

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acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water), wherein the mineral acid is selected from the group consisting of HCl diluted to 37% by weight in deionized water, HNO₃ diluted to 70% by weight in deionized water, H₂SO₄ diluted to 96% by weight in deionized water, H₃PO₄ diluted to 85% by weight in deionized water, and HF diluted to 49% by weight in deionized water, wherein the peroxide is selected from the group consisting of hydrogen peroxide diluted to 29% by weight in deionized water, and ozone, and further wherein the composition has an etch rate greater than about 1000 Å/minute for cobalt at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade.

18-95. (Previously Presented) The etching composition according to claim 94, wherein the mineral acid is HCl and the peroxide is hydrogen peroxide.

96. Canceled

19-97. (New) The etching composition according to claim 94, wherein the composition has an etch rate of about 50 Å/minute to about 250 Å/minute for metal nitride at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade.

20-98. (New) An etching composition, the composition comprising a mineral acid, a peroxide, and deionized water at a ratio in a range of about 1:1:25 (mineral acid:peroxide:deionized water) to about 1:1:15 (mineral acid:peroxide:deionized water), wherein the mineral acid is selected from the group consisting of HCl diluted to 37% by weight in deionized water, HNO₃ diluted to 70% by weight in deionized water, H₂SO₄ diluted to 96% by weight in deionized water, H₃PO₄ diluted to 85% by weight in deionized water, and HF diluted to 49% by weight in deionized water, wherein the peroxide is selected from the group consisting of hydrogen peroxide diluted to 29% by weight in deionized water, and ozone, and further wherein the composition has an etch rate of about 50 Å/minute to about 250 Å/minute for metal nitride at a temperature in a range of about 20 degrees centigrade to about 100 degrees centigrade.

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21-99. (New) The etching composition according to claim 98, wherein the mineral acid is HCl and the peroxide is hydrogen peroxide.

22-100. (New) The etching composition according to claim 64, wherein the mineral acid is selected from the group consisting of HCl diluted to 37% by weight in deionized water, HNO₃ diluted to 70% by weight in deionized water, H₂SO₄ diluted to 96% by weight in deionized water, H₃PO₄ diluted to 85% by weight in deionized water, and HF diluted to 49% by weight in deionized water, wherein the peroxide is selected from the group consisting of hydrogen peroxide diluted to 29% by weight in deionized water, and ozone.

23-101. (New) The etching composition according to claim 68, wherein the mineral acid is selected from the group consisting of HCl diluted to 37% by weight in deionized water, HNO₃ diluted to 70% by weight in deionized water, H₂SO₄ diluted to 96% by weight in deionized water, H₃PO₄ diluted to 85% by weight in deionized water, and HF diluted to 49% by weight in deionized water, wherein the peroxide is selected from the group consisting of hydrogen peroxide diluted to 29% by weight in deionized water, and ozone.

24-102. (New) The etching composition according to claim 73, wherein the mineral acid is selected from the group consisting of HCl diluted to 37% by weight in deionized water, HNO₃ diluted to 70% by weight in deionized water, H₂SO₄ diluted to 96% by weight in deionized water, H₃PO₄ diluted to 85% by weight in deionized water, and HF diluted to 49% by weight in deionized water, wherein the peroxide is selected from the group consisting of hydrogen peroxide diluted to 29% by weight in deionized water, and ozone.